

## REMARKS

In the Office Action, claims 1-24 were rejected. Claims 4, 5, 6, 7, 12, 14, 16, 20 and 21 have been amended. Upon entry of amendments, claims 1-24 will be pending in the present patent application. Reconsideration and allowance of all pending claims is respectfully requested.

### A. Objections to Claims

In the Office Action, the Examiner objected to claims 1, 4-7, 12, 16 and 21 for various informalities, and the Examiner suggested specific amendments to overcome these objections. Applicants wish to thank the Examiner for his careful review. Although the Applicants do not necessarily agree with these objections, Applicants hereby amend claims 4, 5, 6, 7, 12, 16 and 21 as suggested by the Examiner to expedite allowance of the present application. Additionally, Applicants have amended claims 14 and 20 to correct minor informalities. For this reason Applicants respectfully request withdrawal of objections to claims 4-7, 12, 16, and 21.

However, Applicant disagrees with the Examiner's objection to claim 1 and suggestion that line 4 of claim 1 be amended from "an image of the heart using the feature" to "an image of the feature of the heart". Applicants note that the Examiner fails to provide a reason for the suggested amendment. Claim 1 is drawn to a method that includes locating a feature of or relating to a heart with a probe which is inside a body and *registering a representation of the probe with an image of the heart based on a location of the feature*. The recited claim language is supported in paragraphs 33-34 and 37-45 and FIG. 3 in the present application. For at least this reason, Applicants respectfully request withdrawal of this objection to claim 1.

### B. Rejections under 35 U.S.C. § 102

Claims 17 and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Publication 2002/0072670 to Chenal et al. (hereinafter "the Chenal reference"). Claims 1-5 and 7-8 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,896,657 to Willis (hereinafter "the Willis 657 reference").

Claim 12 was rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,685,637 to Rom (hereinafter "the Rom reference").

### 1. Claims 1-6

Claim 1 recites a method comprising locating a feature of or relating to a heart with a probe which is inside a body; and registering a representation of the probe with an image of the heart using the feature.

The Willis 657 reference fails to disclose the steps of locating a feature and registering a representation of the probe of heart based on a location of the feature, as recited in claim 1. In fact, the Willis 657 reference arguably teaches away from the above-described limitation of claim 1. Specifically, the Willis 657 reference discloses:

Referring back to FIG. 1, the registration subsystem 16 generally comprises (1) a plurality of ultrasound transducers, and specifically, ultrasound positioning transducers 36 and ultrasound reference transducers 38; (2) ultrasound ranging circuitry 42 configured for determining distances between various combinations of the ultrasound transducers 36 and 38 in the form of time data; (3) scan line processing circuitry 44 configured for determining the peak amplitudes and transit times of the imaging signals transmitted between the transducer array 60 and the positioning transducers 36; (4) *a registration processor 46 configured for registering the positioning transducers 36 within the global coordinate system based on the time information provided by the ultrasound ranging circuitry 42, and for registering the positioning transducers 36 within the local imaging coordinate system based on the amplitude and transmit time data provided by the scan line processing circuitry 44;* and (5) a coordinate system transformer 48 configured for transforming the local imaging coordinate system into the global coordinate system. (emphasis added.) See col. 8, lines 13-32.

The Willis 657 reference clearly discloses that the registration processor 46 is configured to register the positioning transducers 36 within the global coordinate system based on the *time information*, and to register the positioning transducers 36 within the local imaging coordinate system based on the amplitude and transmit time data as described in the above citation. This disclosure of the Willis 657 reference arguably teaches away from locating a feature of or relating to a heart with a probe which is inside

a body, and *registering a representation of the probe with an image of the heart based on a location of the feature*, as recited in claim 1 as amended.

For at least the above-described reasons, the Willis 657 reference does not teach each and every limitation of claim 1 as amended, and therefore does not anticipate claim 1. A review of the remaining cited references fails to disclose this limitation of amended claim 1. For at least this reason, reconsideration and withdrawal of the rejection of claim 1 is respectfully requested.

Claims 2-5 depend directly or indirectly from independent claim 1, and are believed allowable for at least the same reasons that claim 1 is believed allowable. Claims 2-5 may also recite patentable subject matter in addition to that recited in claim 1.

## **2. Claims 7-11**

For reasons similar to those described above with respect to claim 1, the Willis 657 reference does not disclose, *inter alia*, registering a representation of a probe disposed inside the body with the image based on a location of the at least one feature of the organ or structure, as recited in claim 7 as amended. In fact, the Willis 657 reference teaches away from the recited limitation in disclosing the processors are registered in accordance to time data by scanning circuitry. For at least this reason, the Willis 657 reference does not disclose each and every limitation of claim 7. Accordingly, reconsideration and withdrawal of the rejection of claim 7 is respectfully requested.

Claims 8-11 depend directly or indirectly from independent claim 7, and are believed allowable for at least the same reasons that claim 7 is believed allowable. Claims 8-11 may also recite patentable subject matter in addition to that recited in claim 7.

## **3. Claims 12-16**

Claim 12 as amended recites a system that comprises, *inter alia*, a processor configured to be communicatively coupled to a probe which is inside the body, a memory configured to store an image pertaining to the organ or structure inside the body, the image including the feature, and a display configured to simultaneously display the image

and a representation of the probe, the image being registered with the representation of the probe based on a location of the feature.

The Rom reference does not teach, *inter alia*, a probe inside the body, and a display configured to simultaneously display the image and a representation of the probe, the image being registered with the representation of the probe based on a location of the feature.

Rather, the Rom reference discloses a medical diagnostic imaging system which presents or produces diagnostic information in various languages. Specifically, the Rom reference discloses:

Control of the imaging system is also effected by softkeys, keystroke entry, and menu and graphics manipulation on a graphical user interface (GUI) displayed on the display 20... The central controller is coupled to the video processor 18 which overlays the diagnostic image over the graphical user interface provided by the CPU 32 and can display both in a single time frame. The user may manipulate a pointer or cursor on the GUI, for instance, to select a probe type or display mode such a colorflow or spectral Doppler... The user may manipulate the GUI pointer to indicate areas of the image where borders are to be defined or measurements made, for example, such as heart wall boundaries or fetal gestational age. See col. 2, line 60 to col. 3, line 25.

The alleged pointer described in the above citation from the Rom reference is part of the GUI on a display 20. The alleged pointer is not inside the body. Therefore, the Rom reference does not disclose a system that includes, *inter alia*, a probe inside the body and configured to locate a feature pertaining to an organ or structure inside a body, a memory configured to store an image pertaining to the organ or structure inside the body, the image including the feature, and a display configured to simultaneously display the image and a representation of the probe, *the image being registered with the representation of the probe based on a location of the feature*. For at least this reason, the Rom reference does not teach each and every limitation of, and therefore does anticipate, claim 12 as amended. A review of the other cited references also fail to disclose this limitation. Accordingly, reconsideration and withdrawal of the rejection of claim 12 is respectfully requested.

Claims 13-16 depend directly or indirectly from independent claim 12, and are believed allowable for at least the same reasons that claim 12 is believed allowable. Claims 13-16 may also recite patentable subject matter in addition to that recited in claim 12.

**4. Claims 17-24**

Claim 17 as amended recites a system that comprises a display configured to display an image of a heart and a representation of a probe which is in or adjacent to the heart, where the representation of the probe is registered with the image on the display based on a location of at least one feature of the heart.

The Chenal reference fails to disclose the recited subject matter in claim 17 as amended. Specifically, the Chenal reference does not disclose a display configured to display an image of a heart and a representation of a probe, where the representation of the probe is registered with the image on the display based on a location of at least one feature of the heart.

Rather, the Chenal reference generally discloses an ultrasonic diagnostic imaging system which simultaneously displays an image of the heart and an ECG trace of the heart cycle. A triangular marker is configured to denote the point or phase of the cardiac cycle at which the currently displayed image was acquired. Specifically, paragraph 23 of the Chenal reference discloses:

Referring to FIG. 1, an ultrasound system is shown during the acquisition of cardiac images. The ultrasound image 10 is a four-chamber view of the heart which is acquired by a phased array transducer probe to produce the illustrated sector-shaped image... As the real-time ultrasound image sequence is acquired an ECG trace 12 of the heart cycle is simultaneously acquired and displayed at the bottom of the display, with a triangular marker 14 denoting the point or phase of the cardiac cycle at which the currently-displayed image was acquired. ... As the clinician views the display of FIG. 1, the heart is seen beating in real time in the ultrasound display as the ECG waveform 12 scrolls beneath the ultrasound images 10, with the instantaneously displayed heart phase indicated by the marker 14. See paragraph 23.

The Chenal reference does not disclose a display of an image of a heart and a representation of a probe which is in or adjacent to the heart, *where the representation of the probe is registered with the image on the display based on a location of at least one feature of the heart*. For at least this reason, the Chenal reference *fails* to disclose each and every limitation of, and so cannot anticipate, claim 17 as amended. A review of the other cited references fails to recited subject matter in claim 17 as amended. Accordingly, re-consideration and allowance of claim 17 is respectfully requested.

Claims 18-24 depend directly or indirectly from claim 17, and are believed allowable for at least the same reasons that claim 17 is believed allowable. Claims 18-24 may also recite patentable subject matter in addition to that recited in claim 17.

For example, none of the cited references disclose the system as recited in claim 17, where the probe is configured to sense electrical properties of the heart, and where the feature is a measured electrical conductivity of the organ or structure as detected by the probe, as recited in claim 22 as amended.

#### **C. Rejections Under 35 U.S.C. § 103**

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Willis 657 in view of Willis (U.S. Patent 6,490,474, hereinafter "Willis 474"). Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Willis 657 in view of Sra (U.S. Patent Publication 2005/0143777, hereinafter "Sra"). Claims 10-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Willis 657 in view of Nolte (U.S. Patent Publication 2002/0120192, hereinafter "Nolte"). Claims 13-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Rom in view of Chenal. Claims 18-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chenal in view of Osadchy (EP 1 086 649, hereinafter "Osadchy"). Claims 20 and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chenal in view of Panescu (U.S. Patent 5,487,391, hereinafter "Panescu"). Claims 23-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chenal in view of Rom.

Claim 6 depends directly or indirectly from claim 1, and is believed allowed for at least the same reasons that claim 1 is believed allowed. Claim 6 may also recite

additional patentable subject matter in addition to that recited in claim 1. Accordingly, re-consideration and withdrawal of the rejection of claim 6 is respectfully requested.

Claims 9-11 depend directly or indirectly from claim 7, and are believed allowed for at least the same reasons that claim 7 is believed allowed. Claims 9-11 may also recite additional patentable subject matter in addition to that recited in claim 7. Accordingly, re-consideration and withdrawal of the rejection of claims 9-11 is respectfully requested.

Claims 13-16 depend directly or indirectly from claim 12, and are believed allowed for at least the same reasons that claim 12 is believed allowed. Claims 13-16 may also recite additional patentable subject matter in addition to that recited in claim 12. Accordingly, re-consideration and withdrawal of the rejection of claims 13-16 is respectfully requested.

Claims 18-20, and 22-24 depend directly or indirectly from claim 17, and are believed allowed for at least the same reasons that claim 17 is believed allowed. Claims 18-20, and 22-24 may also recite additional patentable subject matter in addition to that recited in claim 17. Accordingly, re-consideration and withdrawal of the rejection of claims 18-20, and 22-24 is respectfully requested.

### **CONCLUSION**

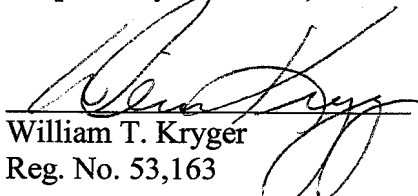
Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

No fees are believed due with this communication. Yet, the Commissioner is hereby authorized to charge any additional fees which may be required regarding this application or credit any overpayment to Deposit Account No. 070845. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension and authorizes payment of any such extension fees to Deposit Account No. 070845.

The Examiner is invited to contact the undersigned at telephone number (262) 548-4654 if it is felt that a telephone interview would advance the prosecution of the application.

Respectfully submitted,

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